

What is claimed is:

- Sub JG*
1. A position sensor comprising:
a resistive element positionable on a first surface;
a pair of leads on the resistive element, the pair of leads adapted to supply
a first voltage;
an intermediate lead on the resistive element between the pair of leads,
the intermediate lead adapted to provide a second voltage; and
a contact element positionable on a second surface, the contact element
adapted to contact at least a portion of the resistive element to detect a voltage at a contact
position, the detected voltage being related to the position or movement of the second surface
relative to the first surface.
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2. A position sensor according to claim 1 wherein the detected voltage is
provided to a position detector which generates an output signal indicative of the position or
movement of the second surface relative to the first surface.
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3. A position sensor according to claim 1 further comprising an additional
lead on the resistive element and adapted to supply the first voltage.
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4. A position sensor according to claim 3 further comprising another
intermediate lead on the resistive element between the additional lead and one of the leads of
the pair of leads.
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5. A position sensor according to claim 1 wherein the pair of leads are
connected to ground.
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6. A position sensor according to claim 1 wherein the intermediate lead is
connectable to a voltage supply.
7. A position sensor according to claim 1 further comprising a second
resistive element positionable on the first surface.

8. A position sensor according to claim 7 further comprising a second contact element positionable on the second surface and capable of contacting the second resistive element.

5 9. A position sensor according to claim 7 wherein the second resistive element comprises a plurality of leads.

10 10. A position sensor according to claim 9 wherein the first and second surfaces are movable relative to one another in a direction, and wherein at least one lead from each resistive element is substantially aligned along the direction.

11. A position sensor according to claim 9 wherein the first and second surfaces are movable relative to one another in a direction, and wherein the leads on the resistive elements are substantially offset from one along the direction.

12. A position sensor according to claim 1 wherein the resistive element is substantially linear.

13. A position sensor according to claim 1 wherein the resistive element is at least partially arcuate.

14. A position sensor according to claim 13 wherein the resistive element is circular.

25 15. A position sensor according to claim 1 wherein the contact element comprises a first brush and a second brush offset from the first brush.

16. A position sensor comprising:
a resistive element positionable on a first surface, the resistive element comprising first and second resistive strips;
a plurality of leads on each resistive strip to provide a voltage to each resistive strip; and
a contact element positionable on a second surface, the contact element adapted to contact at least a portion of the resistive element to detect a voltage at a contact

position, the detected voltage being related to the position or movement of the second surface relative to the first surface.

17. A position sensor according to claim 16 wherein the first and second resistive strips are separated by an electrical insulator or dielectric.

18. A position sensor according to claim 16 wherein the plurality of leads comprises a first lead adapted to provide a first voltage to a resistive strip and a second lead adapted to provide a second voltage to the resistive strip.

10 19. A position sensor according to claim 18 wherein the first lead is connected to ground.

19 20. A position sensor according to claim 18 further comprising a second resistive element positionable on the first surface.

21. A position sensor according to claim 20 further comprising a second contact element positionable on the second surface and capable of contacting the second resistive element.

20 22. A position sensor according to claim 20 wherein the second resistive element comprises first and second resistive strips.

25 23. A position sensor according to claim 16 wherein the resistive element is substantially linear.

24. A position sensor according to claim 16 wherein the resistive element is at least partially arcuate.

30 25. A position sensor according to claim 24 wherein the resistive element is circular.

26. A position sensor according to claim 16 wherein the contact element comprises a first brush and a second brush offset from the first brush.

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27. A position sensor comprising:
a resistive element positionable on a first surface, the resistive element comprising a plurality of portions;
5 a plurality of leads adapted to provide a voltage to the resistive element;
a contact element positionable on a second surface, the contact element adapted to contact the resistive element to detect a voltage at a contact position, the detected voltage being related to the position or movement of the second surface relative to the first surface; and
10 a voltage controller adapted to selectively provide a voltage to the portions of the resistive element in relation to the position of the contact element relative to the resistive element.
28. A position sensor according to claim 27 wherein the voltage controller comprises a plurality of electrical switches.
29. A position sensor according to claim 27 wherein the voltage controller is adapted to provide substantially no power to at least one portion of the resistive element.
30. A position sensor according to claim 27 wherein the voltage controller is adapted to provide power substantially only to the portion of the resistive element being contacted by the contact element.
31. A position sensor comprising:
25 a resistive element positionable on a first surface;
a pair of leads on the resistive element, the pair of leads adapted to supply a first voltage;
a contact element positionable on a second surface, the contact element adapted to contact at least a portion of the resistive element and to provide a second voltage to the resistive element; and
30 an intermediate lead on the resistive element between the pair of leads, the intermediate lead adapted to detect a voltage, the detected voltage being related to the position or movement of the second surface relative to the first surface.

32. A position sensor according to claim 31 wherein the pair of leads are grounded and the contact element provides a voltage from a voltage supply.

5 33. A position sensor according to claim 31 further comprising a second resistive element positionable on the first surface.

34. An interface device for interfacing a user with a computer, the computer running an application program and generating a graphical image and a graphical object, the interface device comprising:

10 a user manipulatable object in communication with the computer; and
a sensor comprising a resistive element on a first surface and a contact element on a second surface, the resistive element comprising a plurality of leads adapted to provide a first voltage and a plurality of leads adapted to provide a second voltage,

whereby the contact element contacts at least a portion of the resistive element to detect a voltage at a contact position, the detected voltage being related to the manipulation of the user manipulatable object and usable to control the graphical object.

20 35. An interface device according to claim 34 further comprising an actuator adapted to provide a haptic sensation to the user in relation to an interaction between the graphical image and the graphical object.

36. An interface device according to claim 34 wherein the detected voltage is further usable to control a slave device.